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WSA

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RMANCE & SPORTS MATERIALS



Knock-on wood benefits

Smart-tag info woven in

New glue breakthrough

Andy Dong on polypro's pluses

THE INTERNATIONAL MAGAZINE FOR PERFORMANCE & SPORTS MATERIALS

Contents



Our 150th front cover:
The Nimbus Mirai running shoe from ASICS. The Japanese brand says it was able to make this shoe "to be remade", due in part to a special type of adhesive, created in house. Glue is the focus of our Footwear Technology article in this issue.

IMAGE: ASICS

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Global news

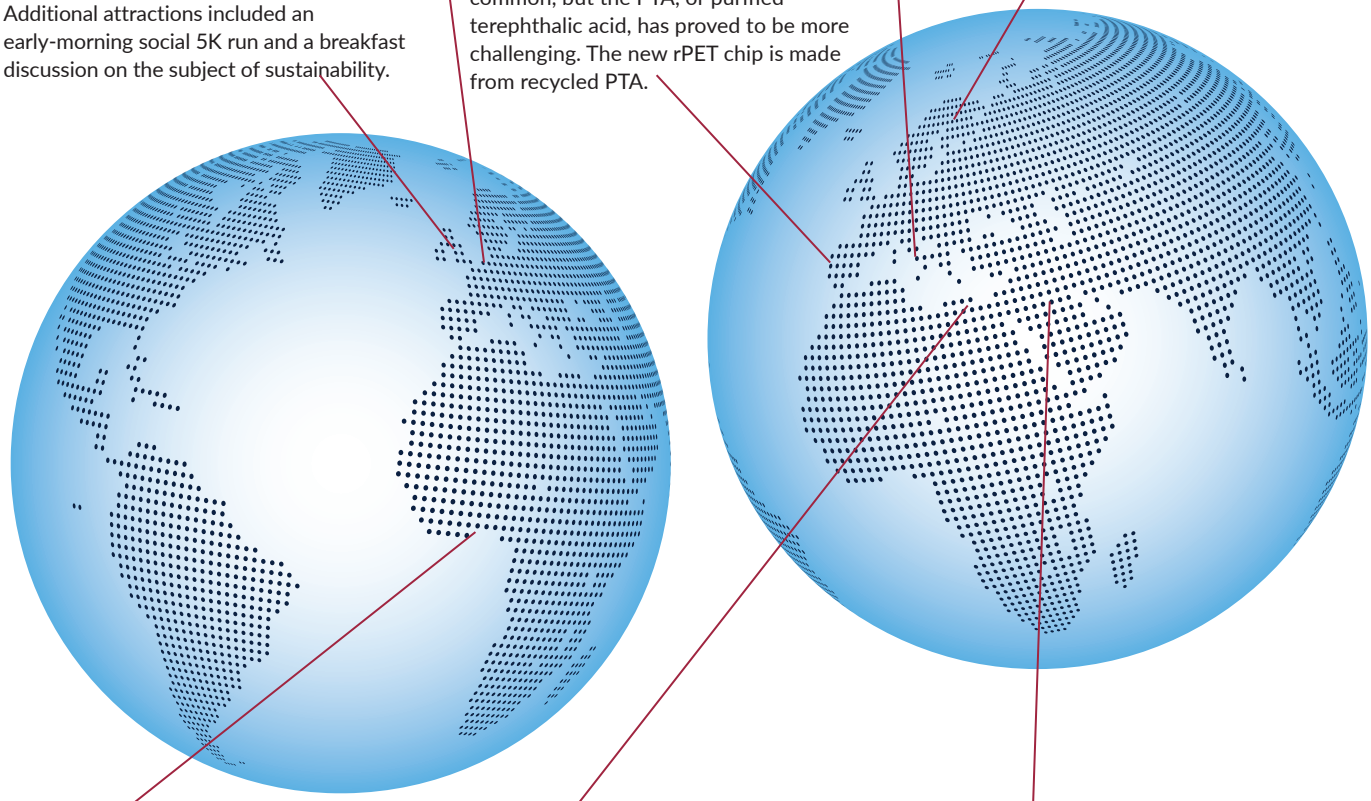
The Netherlands As planned, innovation hub Fashion For Good closed its museum in Amsterdam in June. The museum was a showcase for ideas for making the fashion industry more sustainable. It was open for six years and in that time attracted 115,000 visitors. Among the visitors, there were 8,000 students from 200 different schools. The museum building will now become a space for events and for co-working. Fashion For Good remains committed to its work to "revolutionise the fashion industry".

Italy A famous group of mountain guides in the region of Trentino-Alto Adige in northern Italy, the Aquile di San Martino, has chosen to use footwear from Aku for its work in the Dolomites. Aku said the Aquile, which means 'the Eagles', had chosen to use its specialist footwear for their work in the mountains after extensive testing of the products. It said "the best professionals working in the mountains" hold the brand in high regard.

Finland Scandinavian Outdoor Group (SOG) chose a smart, easy to use rub-on repairing system invented by Finnish company Vaatelaastari as its overall winner for the spring-summer 2025 edition of the Scandinavian Outdoor Award. Extending the usage of an item of clothing is the best way to reduce its environmental impact, the jury noted, but it also singled out collaborations with brands to create patches that match the exact colour of an item of apparel or gear.

UK The Outdoor Show, which bills itself as the industry's only exhibition in the UK, opened its doors in Liverpool on June 18, running until June 20. More than 130 UK and international brands travelled to the Liverpool Exhibition Centre on the city's waterfront to showcase clothing, footwear, backpacks, tents, walking poles and other equipment for sports and outdoor activities of all kinds. Additional attractions included an early-morning social 5K run and a breakfast discussion on the subject of sustainability.

Portugal Selenis, part of Portuguese group IMG, has announced success in producing recycled PET chips from terephthalic acid provided by Circ. The Virginia-based company has developed a technology that chemically recycles polycotton textile waste back into its building blocks. Recovering the monoethylene glycol (MEG) is relatively common, but the PTA, or purified terephthalic acid, has proved to be more challenging. The new rPET chip is made from recycled PTA.



Benin The Cotton made in Africa (CmiA) initiative has announced its support for a project that aims to capitalise on the popularity of football to promote economic growth in developing countries. A programme set up by the World Trade Organization (WTO) and the sport's global governing body, FIFA, will aim to integrate West Africa cotton-growing countries more closely in the global value chain for football shirts. FIFA and the WTO have given the name Partnership for Cotton to this initiative and at a recent meeting in Benin welcomed CmiA as a member of its steering committee.

Egypt The United Nations Industrial Development Organization (UNIDO) has unveiled a plan for a circular textiles system in Egypt following a five-year pilot project, run in collaboration with the European Union and the Egyptian government. Pilot initiatives revealed how to improve waste collection, sorting and segregation practices within 11 textile companies and streamline pre-consumer textile waste handling in the chain.

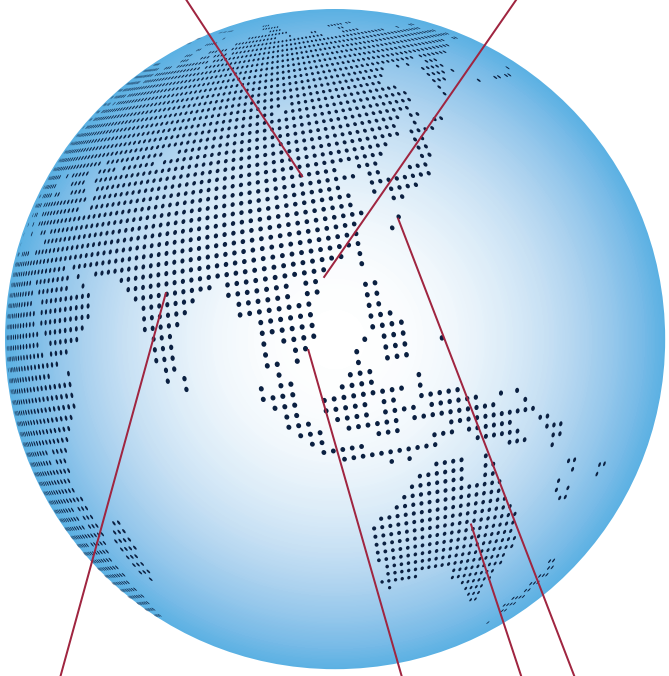
Saudi Arabia Design school Istituto Marangoni has reached an agreement with the authorities in Saudi Arabia to open a new fashion school there. Istituto Marangoni has its headquarters in Milan, but it also runs schools in Paris, London, Miami, Dubai, Shenzhen, Shanghai and Mumbai. Its newest school will be in Riyadh, opening in 2025, it said. Its aim will be to foster local creative talent and "fuel innovation in this dynamic market".

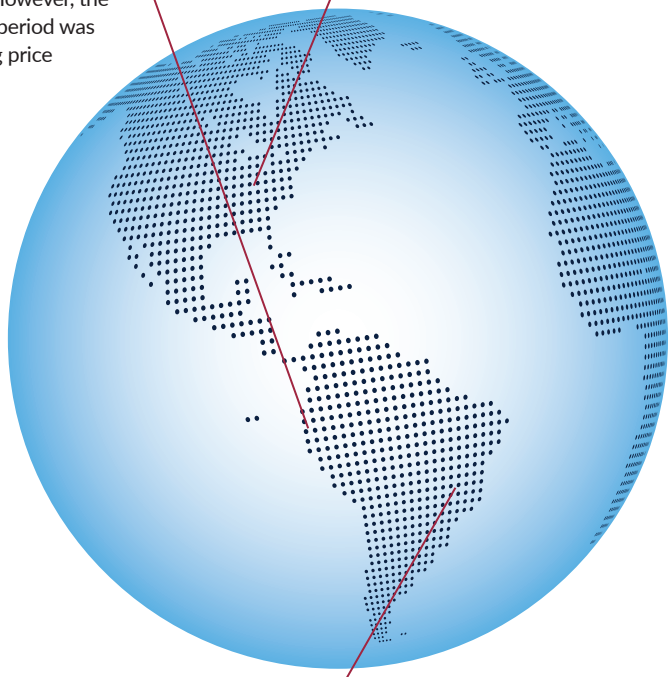
China Figures from China show that exports of polypropylene in March were greater in volume than imports of the same polymer. Industry information resource CCF Group said this was the first time exports of polypropylene had exceeded imports. Total imports of polypropylene for the month were 310,700 tonnes, compared to export volumes of 315,500 tonnes.

Peru Textile mill Nuevo Mundo has partnered with chemicals provider Archroma to offer collections that have been coloured using EarthColors dyes, which are based on non-edible agricultural waste. Lima-based Nuevo Mundo specialises in the spinning, weaving and dyeing of cotton flat fabrics and their blends. It has a particular focus on the development and innovation of denim fabric.

US Chemovator, a business incubator and early-stage investment platform that chemicals group BASF set up in 2018, has added Detroit-based natural fibres specialist Heartland to its portfolio. Heartland works with local farmers to develop plastic additives from natural fibres, including hemp. Heartland said hemp-based additives improve properties such as flammability, bonding, dispersion, and bulk density.

Hong Kong Athletic footwear manufacturing group Yue Yuen has reported revenues of just over $2 billion for the first quarter of 2024, a decline of 4.9% compared to the same quarter last year. However, the volume of shoes the group produced in the three-month period was 58.8 million pairs, an increase of 9.1%. Its average selling price decreased by 9.2% year on year to $19.55 per pair.





India Sportswear company Techno Sport has become the first brand in India to join Bluesign Technologies as a system partner. Swiss company Bluesign offers suppliers and manufacturers on-site assessments and certifications to ensure processes and products are free from harmful chemicals. Managing director, Sunil Jhunjhunwala, said the move would drive innovation at Techno Sportswear.

Brazil Brazilian group Suzano is to acquire a 15% stake in cellulosic fibres group Lenzing from main shareholder B&C Group. São Paulo-based Suzano describes itself as the world's leading producer of wood pulp and one of Latin America's largest paper producers. The Brazilian group's chief executive, Walter Schalka, commented that Lenzing was already a leading global supplier of fibres, but said: "We recognise opportunities for further growth with its established technology, product range and technical knowledge."

Taiwan Industry representative body the European Outdoor Group (EOG) has announced details of the first project that will be funded from a financing initiative, the Impact Accelerator Fund (IAF), that it set up at the end of 2023. The project will focus on increasing access to renewable energy in Taiwan. EOG said it has the potential to benefit many outdoor brands because Taiwan is "a key manufacturing base for the outdoor industry".

Vietnam Open-cell foam technology developer OrthoLite's Cirql business, launched in 2022 and based in Ho Chi Minh City, has unveiled a new midsole foam called Cirql rTPU30. This "fully recyclable" material is 30% post-consumer recycled thermoplastic polyurethane (TPU). Its claims have Global Recycled Standard approval. It is produced without chemicals, using a patented supercritical foaming process.

Australia Biomaterials company Modern Meadow and Australian sportswear brand Earthletica have teamed up to make the Bronte Jacket, named after Olympic gold medallist swimmer Bronte Campbell, who will wear the jacket at the Australian Olympic swimming trials. The Bronte Jacket incorporates a membrane, developed using a system that combines proteins with bio-based polymers. The proteins provide the channel for moisture to move through the material for additional breathability while remaining waterproof.

Industry & Innovation


CREDIT: UNDER ARMOUR

First elastane-alternative garment comes to market

Sports brand Under Armour has announced a first garment to use elastane alternative Neolast. It presented Neolast at the start of 2024, after working on its development with Dallas-based materials company Celanese Corporation. The partners described the fibre as offering powerful stretch properties along with durability, comfort and high levels of moisture wicking, but also recyclability.

It is produced using a proprietary, solvent-free, melt-extrusion process. This process offers what the companies have called "increased production precision", allowing spinners to dial power-stretch levels up or down and engineer fibres to meet a broad array of fabric specifications.

The first Neolast garment to come to market is a new version of the Under Armour Vanish Pro T-shirt for athletic training and gym work.

Senior product director at Under Armour, John Hardy, said the T-shirt had a minimalist design to "allow the Neolast material to shine". He said the durability of the material would increase the product's lifespan.

Partners to continue cotton-based dye project

Textile chemicals group Archroma has extended a partnership it set up with Cotton Incorporated in 2016. Non-profit organisation Cotton Incorporated approached Archroma the same year and suggested a joint project to develop a dyestuff from by-products of the cotton industry. Cotton farming and processing generate by-products such as burs, stems and leaves.

Cotton Incorporated recognised that these natural by-products, which are already going into packaging, insulation and other products, could also be used to produce dyes.

The Archroma research team applied the technology it uses to make the EarthColors range of biosynthetic dyes that the company introduced in 2014 to create a new variety, Diresul Earth-Cotton. The dye based on cotton by-products offers warm, natural shades, Archroma has said.

Spun yarn breakthrough

The fibres division of Japanese group Teijin has launched a new polyester spun yarn. Teijin Frontier said the new spun yarn, which it has called Octa SF, is lightweight and provides "a soft, gentle feel, fluffiness, moisture absorption and heat retention". It said the new product will work particularly well for textiles

Chemical contribution

Chemicals group BASF took part in the 2024 Plastics Recycling Show Europe in Amsterdam in June. At the event, BASF argued that chemical recycling of plastic-based fibres complements mechanical recycling and can increase overall recycling rates and make an important contribution to "a more circular economy for plastics". The group has its own chemical recycling business, called ChemCycling. It uses plastic waste-based feedstock to process high-performance products.

Smart circular swimwear

For a new swimwear range under its Nabaiji brand, sports retailer Decathlon has paired a non-elastane stretch fabric with a dissolvable sewing thread developed by Belgian company Resortecs. The fabric used, Negombo, was developed by Decathlon with The Lycra Company, and is made from Lycra T400. This stretch polyester-type yarn is partially biobased and makes it possible to create near monomaterial swimsuits.

Softest yet

Sports brand Puma has launched a new collection of training gear, calling it its softest collection yet. It has applied the name Cloudspun to the new line of training apparel. Cloudspun has been a Puma apparel technology since 2020, when the brand first used it in its golf category. The new training apparel collection using a "custom-milled performance polyester-spandex blend" fabric. A proprietary brushing process enhances the fabric's softness.

Wax lyrical

Montana-based technical outdoor clothing brand Forloh has said the ripstop fabric it has used in a new product offers 50% more abrasion-resistance, water-resistance and protection from thorns than previous fabrics it has used. The product in question, the Brush To Mountain (BTM) Pro Pants, uses a waxed nylon-cotton blend. It is this wax emulsion treatment that provides the extra performance, according Forloh's founder and chief executive, Andy Techmanski.

used in sportswear and outerwear.

To create this new spun yarn, Teijin Frontier developed an ultra-fine staple fibre with a hollow, eight-fin modified cross-section, which the company has processed using special spinning and drawing technologies.

It said Octa SF overcomes the softness limitations of existing staple fibres made of filament yarn, and addresses "demands for new materials that combine high performance with desirable tactile feel". Now, Teijin Frontier intends to use the yarn to develop "special-structure fabrics".

Separately, Teijin has also announced a new breathable, UV-blocking polyester material. It said the new material "replicates the structure of a traditional bamboo blind". The traditional Japanese 'sudare' blind allows air to pass through while blocking out sunlight. In a similar way, the new polyester material combines high levels of breathability with UV protection, Teijin Frontier has said.

Recycling start-up secures investment

Sports group Decathlon has become an investor in a Lyon-based chemical textile recycling technology provider, Recyc'elit.

Founded by brothers Karim and Raouf Medimagh in 2020, Recyc'elit has developed a proprietary method for separating out the different fibres in textile waste to offer mills and brands recycled polyester, elastane and polyamide for use in new applications.

The start-up aims to have a pilot plant in operation in the course of 2025.

Decathlon's director of alliances and new business, Franck Vigo, said the group believes it has a responsibility not just to find solutions for the textile waste challenge, but to help cultivate them, refine them and help them to have an impact in the market.

Progress for Cycora

Fibre manufacturing group Hyosung is to work with Ambercycle to make textile-to-textile, circular polyester available to manufacturers in South Korea. Ambercycle has developed molecular regeneration technology that it uses to make regenerated polyester from end-of-life textiles. It uses the brand name Cycora for yarns and fabrics developed from this regenerated polyester.

Hyosung chief executive, Chi Hyung Kim, said the company had been impressed by the quality of Cycora and by its potential for diverting tonnes of textile waste away from landfill and incineration. "This is another important step we are taking to help our customers meet their sustainability goals," he added.

Apparel group MAS Holdings has also joined forces with Ambercycle in its own bid "to scale up textile-to-textile regeneration". This partnership will centre on a three-year offtake agreement that will allow MAS to reserve capacity to use Cycora.

This will help Ambercycle "expedite efforts to reach commercial-scale production as quickly as possible" and will help MAS achieve one of its key objectives: to derive 50% of revenue from sustainable products by 2025.

New benchmark

A first complete spinning process using Rieter's latest air-jet spinning technology is to go into a textile manufacturer in China. Guangxi Baisheng Textile has signed an agreement with the Swiss textile machinery developer to use its J70 air-jet spinning technology in its set-up.

The partners have said this will allow Baisheng to increase automation levels in its operation and reduce conversion costs, setting "a new benchmark in air-jet spinning in terms of quality and productivity". Baisheng is a vertically integrated textile company. Its aim is to ensure a steady yarn supply for its knitting operations.

Rieter's J70 air-jet spinning machine offers a high level of production efficiency and features 200 individually automated spinning units. The J70 boasts delivery speeds of up to 600 metres per minute and supports up to four lots simultaneously.

True-to-life

Scottish textile and apparel machinery maker Ardmel Group is introducing a new testing device for moisture management, The Comparator, which it says measures a fabric's performance in true-to-life conditions. The Comparator, the company says, will make it possible to see how fabrics perform in both wet and dry conditions, and specifically improve garment performance by measuring condensation created by the microclimate of the textile.

Cotton-tracking

Verification technology solution FibreTrace has announced a new partnership with retail group Target and agribusiness Cargill. FibreTrace's technology works by integrating luminescent pigments into raw fibres. In this project, the pigments will go into raw cotton. The pigments can be tracked and identified across the supply chain. This partnership will involve marking 50,000 tonnes of US and Brazilian cotton in the first 12 months. It started with new-crop US cotton in November 2023.

New owner, new name

An investment firm in Sweden, Altor, has acquired the remaining assets of textiles recycling innovator Renewcell. Before filing for bankruptcy in February, Renewcell developed a specialism in recycling cellulosic textile waste. It transformed this into a new material called Circulose. Altor has chosen to use Circulose as the name for the relaunched company.

Almond essence

UK outdoor brand Vollebak has expanded its natural dye collection with a series of clothes coloured with almond waste. Since 2019, the brand has "been on a mission to rethink how colour is made" to reduce its reliance on petroleum-based dyes. It has worked with black algae dye, minerals such as hematite and celadonite and naturally occurring pigments found in DNA.

Bottle-building

Taiwanese textiles developer Far Eastern New Century has begun work to increase its capacity to recycle PET bottles. It has inaugurated a new plant in Japan and will launch a Vietnamese plant before the end of this year. The group has also broken ground on an expansion at its recycled polyester factory in Malaysia.

People

New marketing manager for Hyosung Europe

Korean textile group Hyosung is bolstering its European teams and has named **Andreas Puchert** its new European marketing manager.

A textile engineer, Mr Puchert has held executive positions at ellesse, Puma, C&A and was, just before joining Hyosung, director of Retailpraxis, a sustainable fashion and sportswear sourcing company. He is based in Düsseldorf.

"Andreas brings enormous resources to our team," says **Claire O'Neill**, European marketing director of Hyosung Textiles. "His tremendous understanding of European brand, retail and consumer needs, will help us further our global position as a major textile solution provider."



CREDIT: HYOSUNG

Hall of fame honour

The founder of insole materials developer OrthoLite, **Glenn Barrett**, has been inducted into the US National Sporting Goods Association hall of fame. NSGA said it had decided to include Mr Barrett in its hall of fame owing to the impact that OrthoLite's open-cell foam insole solutions have had on the footwear and sporting goods sectors.

For its part, OrthoLite said Glenn Barrett had "revolutionised the footwear segment of the sporting goods industry from the inside out". He founded the company in 1997. Today OrthoLite partners with more than 550 footwear brands.

Commenting on the honour, Mr Barrett said: "I'm incredibly proud of what this says about OrthoLite's product and the team behind that product. Together, we created an entirely new category of materials to go inside shoes. We identified a need and provided a solution that's now universally accepted as a comfort and performance enhancement for all categories of footwear."

Luxury veteran is new TNF president

Outdoor group VF Corporation has named **Caroline Brown** as president of The North Face, succeeding **Nicole Otto**.

Most recently she was a managing director at Closed Loop Partners, a New York-based investment firm and innovation centre focused on the circular economy, where she led the firm's fashion practice. She previously served as CEO of Donna Karan International (DKI) and DKNY. She led the company through the sale from LVMH to G-III Apparel Group.

Prior to DKI, Ms Brown was president of Carolina Herrera and US CEO of Swiss brand Akris.

VF has also announced the nomination of **Sun Choe** as global brand president of its Vans footwear brand. The former head of product design at Canadian brand Lululemon will take on her new function in late July.

Her career includes stints at Marc Jacobs, West Elm, Madewell, Urban Outfitters, Levi's and the Gap. During her tenure, lululemon quadrupled revenues and strengthened profitability while expanding into new product lines and geographies, VF stated.

Elevate CEO

US-based Elevate Textiles has appointed **Jeffrey Pritchett** as CEO. He most recently served as senior operating executive of private equity firm Cerberus. He previously served as chief operating officer at Champion One, chief financial officer at InnerWorkings, and held senior leadership positions at Vertis Communications, General Motors and Delphi Automotive. Elevate Textiles owns American & Efird, Burlington, Cone Denim, Gütermann and Safety Components.

Fibre certainty

A former prime minister of New Zealand, **Sir John Key**, has said traceability technology provider Oritain is able to show rather than just tell customers that wool, cotton and other products meet their requirements. He is now the company's chairman. He said the company's technology, which uses forensics and statistics to identify an 'origin fingerprint' for fibres, can give customers and regulators certainty.

Personal style

Former footballer **David Beckham** has agreed to a multi-year partnership with clothing brand Hugo Boss. The former captain of the England national team will work with the Hugo Boss team on capsule and seasonal collections that "echo his personal style". Hugo Boss said partnerships of this kind are "an essential aspect of its future expansion strategy".

Creative move

Outdoor brand Canada Goose has named **Haider Ackermann** as its first creative director. The Colombian-born French designer will be based in Paris and work alongside CEO, **Dani Reiss**, to guide the company "into its next era". Mr Reiss said: "We are excited about the opportunity ahead of us."

Americas change

UK-based outdoor group Pentland Brands has appointed **Joe Spies** as president of its Americas business. He replaces **Matt Rock**, who steps down after a 19-year tenure. Matt Rock's career with Pentland Brands began in 2005 when he joined as sales director for Ted Baker footwear, later advancing to managing director of the brand.

WFSGI CEO appointment permanent

The World Federation of the Sporting Goods Industry (WFSGI) has made **Emma Zwiebler's** appointment as its chief executive permanent. She took up the role on an interim basis in November 2023.

A former sports lawyer and international badminton player, Ms Zwiebler joined the WFSGI six years ago as its vice-president for strategic and external affairs.

At the start of this year, when the WFSGI published its fourth annual sporting goods industry report, Emma Zwiebler described the problem of inactivity, especially among young people, as "human climate change".

On becoming permanent chief executive, she said: "I'm excited to lead the WFSGI through our next phase of growth and plan to double down on our priorities (environmental, social and governance, and physical activity) with our members."

New heights

Non-profit organisation Cascale, formerly the Sustainable Apparel Coalition, has announced that **Colin Browne** has taken over as its chief executive.

Mr Browne was chief operating officer of Under Armour until June 2023 and also served for a time as the brand's interim chief executive. After Under Armour, he became managing director of sourcing in Asia for VF Corporation.

Cascale said it would look to his leadership to help it "explore and develop true accountability measures alongside deeper commitments". Cascale also said it wants to "amplify its data-driven programmes and its Higg Index tools.

Reshuffle at Lululemon

Following **Sun Choe's** departure from Lululemon, the company's head of product, **Jonathan Cheung**, will fill the top product management position. The denim industry veteran joined Lululemon in January as global creative director.

Mr Cheung will continue to oversee design, innovation and product development, the company says, and he will also drive the product design and the company's innovation roadmap. The designer has worked for major brands and has served as advisor to several textile innovation companies including unspun, Infinited Fiber Company and Pangaia.

Skills mix

The managing director in Europe of outdoor brand Black Diamond Equipment, **Stephan Hagenbusch**, is to join the European business of Patagonia.

He will move to Amsterdam to become Patagonia's marketplace director, overseeing wholesale, e-commerce and retail activities for the brand, as well as supporting engagement with customers and communities across Europe. Before joining Black Diamond five years ago, Stephan Hagenbusch held a series of senior roles at Amer Sports.

Patagonia's general manager in Europe, **Nina Hajikhanian**, said the brand had sought "someone with a mix of technical expertise and creativity, who shares our passion for outdoor sports and brings a healthy dose of down-to-earth collaboration" to the role.

Advances in recycled fibres

The CEO of recycled cotton company Recover has said structural changes are needed in brands for decision-makers to have the freedom and power to invest in more sustainable fibres and fabrics, as they are too often constrained by profits and cost.

Anders Sjöblom, who joined the Spanish company from H&M in January, also told the United Nations Fashion and Lifestyle Network meeting in New York that the recycled fibres industry had advanced more than most people realise.

"We have had a revolution in terms of our technology in the last two years. We can add 40% recycled cotton into the yarn without losing quality, when before it was 10%," he said.

Central position

Sportswear brand Puma has appointed **Bas van den Bemt** as its managing director for Central Europe, replacing **Nina Graf-Vlachy**, who will pursue opportunities outside the company. Mr van den Bemt has been with Puma since 2009 in various management and sales positions. He oversaw the Benelux business for more than eight years and most recently worked as the managing director of Puma UK and Ireland. **Lucynda Davies** will take over his previous role in those markets.

Landscape architect

Indian group Arvind has appointed **Susheel Kaul** as its managing director for textiles, a promotion from his role as CEO of textiles and apparel. Arvind said his comprehensive knowledge of the industry landscape, coupled with his innovative approach to business challenges, makes him the ideal candidate to lead the group into its next phase of growth and expansion.

New VP for Sorel

Columbia Sportswear has brought in **Michael Minter** as vice-president of its Sorel footwear brand. Mr Minter has spent 20 years in senior creative and marketing leadership roles at footwear brands including Sanuk, Billabong, DC Shoes and Keen. His appointment at Sorel comes as it prepares for what new brand president, **Cory Long**, has referred to as "a new chapter of growth". Cory Long came to Sorel at the end of last year, replacing **Mark Nenow**.

Speaker's corner

Chief executive of Norrøna, **Jørgen Jørgensen**, spoke to audiences in New York and Boston during a recent trip to the US. He offered an account of the history of the Norwegian outdoor clothing brand that his great-grandfather (whose name he shares) founded in 1929. Mr Jørgensen spoke first to an audience in the company's New York store on May 1. The second event took place at the company's new store in Boston on May 3.

Surface success

After **Carlos Alcaraz's** victory in the 2024 Roland-Garros tournament in Paris on June 9, equipment manufacturer Babolat joined the celebrations. The Spanish player won the tournament using Babolat Pure Aero 98 rackets. This title makes him, at 21, the youngest player to win Grand Slams on clay, grass and hard courts.

Backtrack

Limitations on space make it impossible for us to run more than a carefully selected sample of industry news in *WSA*. However, we publish hundreds more stories on www.sportstextiles.com, one of the most comprehensive archives of news anywhere on the web for textiles, apparel, footwear and equipment for sports and outdoor. Below are just some of the headlines that have appeared on the site in recent weeks.

20 June 2024

A passage to India for AbTF

ZDHC welcomes partners' generosity on hazardous chemicals

Smart circular swimwear

UK Outdoor Awards finalists announced

19 June 2024

Outdoor participation in US hits record levels

18 June 2024

Carbios teams up with Tomra

Patagonia develops end-of-life solutions for wetsuits

17 June 2024

NILIT publishes new impact report

Farmers plead for rethink as EU Council votes on PEF

14 June 2024

Organic Basics introduces algae-dyed range

Second edition of Bangladesh Circular Economy Summit

13 June 2024

Fashion360 unites UK industry on circularity

Merino makes performance beachwear possible for Arena

12 June 2024

Primary data helps Equip improve its carbon footprint calculations

Rukka salutes Olympics with Spinnova-based top

Archroma's colour tool aims to smooth brand-mill transactions

11 June 2024

IPO will give valuation of around €1.75 billion for Golden Goose

Made in France... by Puma

10 June 2024

Athletes to put insoles to the test

Napapijri ties up with Good Earth Cotton

International sales drive 10% rise for Lululemon

07 June 2024

Carbon fibre certification for Teijin Europe

Green chemistry start-up breaks down blends

Novel waterless dyeing solution for cellulosics

06 June 2024

Vienna stock exchange award for Lenzing

Future Fabrics to debut Footwear Innovation Hub

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Boardriders finds new home in Europe

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Salomon lands on the Champs-Élysées

EOG to 'shake-up' OutDoor by ISPO format

03 June 2024

Outdoor By ISPO opens in Munich

New warehouse will support growth in 'crucial' US market, Puma says

Accelerating Circularity publishes trial results

31 May 2024

Millet ushers in local and high-tech made trail running shoe

'Fresh assortments' give Foot Locker confidence

Footwear sales fuel full-year growth for JD Sports

30 May 2024

Careful cotton choices in Ternua collection

Sponsorship of distance-running events continues for Thinsulate

Cradle to Cradle to release new standard

29 May 2024

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In addition to going into manmade cellulosic fibres, the renewable resource that is pulped wood is also being tapped for other textile industry supplies, including polymers and chemicals, offering a new array of materials that are not derived from fossil fuels.

No wood to waste

For makers of wood-based fibres, nothing is lost. The parts of timber that are not turned into cellulose pulp are commonly used to power the factories that make viscose-family fibres. Now, as the race heats up to find alternatives to petrochemicals, some trailblazing companies are finding other ways to transform this natural and renewable raw material into polymers and chemicals.

Many seek to use only leftover wood. The timber industry, like that of apparel, generates its fair share of waste. "In the US alone, it is 50 million tonnes every year," says Jane Palmer, founder and CEO of Nature Coatings. For Kristoffer Ekman, co-founder of NordShield, waste is not the proper term: "I wouldn't talk of waste, as everything is used in forestry." He sees it as a 'residue' that is full of resources, and he is not alone.

From chemicals and pigments

The result of more than a decade of research, the antimicrobial finish that NordShield has developed and patented is drawn from pine tree resin, "a side stream of the forestry industry," Mr Ekman tells *WSA*. "Since the early 1980s, the inventor of the process had been looking for a sustainable alternative to biocides. He tested a wide array of substances and found that pine tree resin was a highly effective antimicrobial agent, which has been used in wound-care for ages." Based in Espoo, Finland, and founded in 2016, the company launched its biobased odour-capturing technology, NordShield Crisp, last year. "It is a non-biocidal, non-leaching, biodegradable and plant-based anti-odour technology," he says. The finish is said to form a two molecule-thick film on the surface of the textile, and can withstand up to 30 washes. "It is a physical film, but it doesn't impact hand-feel," he adds.

In addition to NordShield Crisp, made for cellulose-rich fabrics, the company also offers a citric acid-based antimicrobial for synthetics, NordShield Citex, which is also biobased and



APRí Sportswear has just launched with two ranges, one is treated with NordShield's Crisp wood-derived anti-odour technology, made for cellulose-rich fabrics. The other, polyamide range, uses HeiQ's mint-based antimicrobial.
CREDIT: APRÍ SPORTSWEAR

biodegradable. “Safe by design is an important principle for us,” says Mr Ekman. “Consumer awareness is growing, and many mills and brands are switching away from metal-based biocides.” The wood resin-derived finish is in advanced trials at major brands, is already being used by a shoe manufacturer in Asia, and he expects to be able to announce specific collaborations with brands and mills later this year.

Start-up Scandinavian athleisure brand APRí Sportswear launched its first series of products this June, incorporating NordShield Crisp-treated loungewear in a cotton-lyocell blend. Brand co-founder Evelina Boström seeks to make high-quality activewear designed for longevity, which brought her to choose the plant-based anti-odour finish. “It allows users to wash their clothes less often and thus saves energy and water. It reduces their carbon footprint and preserves the garment itself,” says Ms Boström, who describes NordShield’s Crisp as “ground-breaking”.

Nature Coatings has been breaking new ground in the world of pigments with its wood waste-derived BioBlack for nearly ten years now. Made from certified FSC-recycled wood waste, it is a safe, non-toxic and carbon-negative alternative to petrochemical carbon black. Sales are growing, says founder, Jane Palmer, and the company has expanded its distribution network, its product offering (with two dispersions in addition to the pigment) and can now rely on its fully commissioned factory, located in the south-east of the US. “It allows us to control quality and pricing, as we no longer contract out manufacturing. The wood waste comes from within 60 miles (95 kilometres) of the plant, and we make everything under one roof,” she tells *WSA*. This marks a new stage of development for the company that can now produce hundreds of tonnes per month, she says.

Nature Coatings has set up warehouses and distribution facilities in Portugal, Italy, Turkey, as well as Pakistan and Dubai with its partner iTextiles. Denim has been a big focus for the company, but sportswear and athletic footwear makers also use the black pigment for screen printing, rotary printing and coatings. A new application, as a solution for dope-dyed cellulose yarns, is in trials with a MMCF manufacturer based in India. “This development can be called a match made in heaven,” says Ms Palmer, “as it is a wood-based fibre dyed using a wood waste-derived pigment.”

To polymers and more

The cellulose and lignin content of wood can also supply ingredients for bioplastics and biosynthetics, as some companies have been investigating, with varied results. Origin Materials, based in West Sacramento, has been working on extracting chemicals and polymers from wood waste since 2008, when it was spun off from the University of California, Davis. It went public in 2021, and has a biorefinery running in Sarnia, Canada. But the company’s “biomass conversion technology” has, for now, only been used to make PET caps and closures, first from corn starch and, as of this April, from locally sourced wood residues. This achievement has helped take its share price past the $1 minimum threshold on the Nasdaq exchange.



US-based Nature Coatings has a factory up and running. It is expanding its distribution globally and its product range to include two dispersions along with its BioBlack pigment.

CREDIT: NATURE COATINGS

Origin Materials expects to be able to produce building blocks for polyesters through its CMF (chloromethylfurfural) platform, a chemical that can theoretically be converted into bioMEG, and possibly even bioPTA, to produce a biopolyester. It signed a memorandum of understanding with Indorama Ventures in 2023 and had formed a similar partnership with PrimaLoft two years earlier. Origin has recently licensed a process technology from Dutch company Avantium to convert derivatives from CMF into FDCA (furandicarboxylic acid), a building block for a biopolymer known as PEF (polyethylene furanoate) that Avantium is developing.

UPM Biochemicals, a division of the UPM industrial group, a €10 billion company specialising in wood-derived products, is also seeking to make the building blocks for a biopolyester. It uses a different technology and has already supplied Indorama with its BioPura BioMEG. It has invested €1.1 billion in the construction of a biorefinery in Leuna, Germany. Initially planned to go into service late last year, it should begin operating at the end of 2024. At full capacity, it should produce 220,000 tonnes annually of biodiesel and bio-naphtha from the lignin and cellulose (sugars) of German-grown beechwood. In addition to bioMEG, other products could be derived from these substances, as lignin also produces a carbon black, David McCann, lead business development, tells *WSA*. He adds that demand for polymers from the fibre and plastic industries is currently stronger than from other industries.

UPM Biochemicals has been supplying Dyneema, a former DSM company now owned by Cleveland-based Avient, with wood-derived

> **“Wood waste is an abundant material that can be used to make many non fossil-fuel based materials and chemicals.”**
>
> MINNA LAITINEN, NORDIC BIOPRODUCTS GROUP

bio-ethylene. German outdoor sportswear brand Vaude presented a fleece jacket last year made from a biopolyester fibre that was polymerised and spun into yarn by Indorama from UPM’s BioPura BioMEG and conventional PTA, and knitted into a fleece fabric by Italian mill Pontetorto.

Speaking at a Performance Days conference in March, Vaude’s head of innovation, René Bethmann, said that this prototype, presented at ISPO last year, was “a first milestone” in the use of bioMEG to make a polyester yarn. “The next phase, for us, is to have a bioPTA, which makes up 70% of a polyester fibre,” he told the audience. He suggested that bio-naphtha could be transformed into paraxylene and then terephthalic acid (PTA). UPM Biochemicals declined to comment.

Many start-ups and companies in Scandinavia focus on wood, a key industry for the region, and quite a few seek to develop more sustainable viscose-making processes, seen at TreeToTextile, or invent new fibres, as Spinnova is doing. Founded in 2019, Espoo-based Nordic Bioproducts Group (NPG) aims to make both a low-impact cellulosic fibre and biochemicals and bioplastics from wood. Norratex, the name it has given its MMCF yarn, has been in development since 2022. “Our process is similar to that of viscose but doesn’t use any harmful chemicals. The fibre feels like cotton and drapes like viscose,” says co-founder and CEO, Olli Kähkönen. In his discussions with large fashion retailers, he has found that making fibres from wood was not viewed as favourably as he thought. “This is possibly the result of the work done by Canopy, which we fully support,” he tells *WSA*, but it signalled to him that wood had lost its lustre as a source of fibre. The start-up has since pivoted to focus on agricultural residues, wheat straw or bagasse, as sources of pulp, and is currently working with major MMCF producers; Mr Kähkönen sees this as a long-term project that could take five or 10 years.

Currently, operations at NPG’s first microcrystalline cellulose (MCC) plant have begun using what it calls AaltoCell Technology, developed at nearby Aalto University by company founder, Dr Olli Dahl. In addition to medical applications (as an excipient), it can also be used in bioplastics. “We can make the ingredients for biodegradable wood-based buttons and accessories for the fashion industry,” says innovation lead, Saara Suurla. Local creative lab, Structural Colour Studio, makes bio-sequins from the company’s cellulose-based biochemicals. The shimmering colours of the sequins are not the result of a dye but of a coating that forms nanostructures that reflect light in various colour frequencies, like butterfly wings or peacock feathers. “Wood waste is an abundant material that can be used to make many non fossil-fuel based materials and chemicals,” points out NPG sales manager, Minna Laitinen.

There is, thus, a wide array of valuable and beautiful textile products that can be made from this type of waste. This is proof that wood residues offer more resources than meets the eye.



Structural Colour Studio’s shimmering wood crystals were created by Aalto University students using a cellulose-based coating supplied by Nordic Bioproducts Group

CREDIT: MIKKO RASKINEN



The very first fleece jacket made from a partially wood-based polyester was presented by Vaude and UPM Biochemicals at ISPO last year.

CREDIT: VAUDE

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The emergence of new business models and the likely implementation of digital product passports may require new features and functions that warrant extending the range of traceability technologies.

Smart tracks

Year, size, gender, style. Fibre origin and composition. Chemicals, additives and dyes. Certifications and maybe an eco-impact rating or eco-score. Some of these data points are easy enough for brands and retailers to obtain and verify, others less so. Some information is useful only for supply chain purposes, but some could be required in time for large-scale recycling facilities. And before an item of clothing reaches that stage, keeping track of a product when it is in the hands of its actual user has high brand-building potential, via storytelling, loyalty programmes, and so on.

In these new scenarios, purely digital tracing technologies might not offer the necessary features or guarantees; the product itself may need to be identifiable throughout its entire life. It can be argued that it should be 'readable' by a user, reseller, renter and recycler. Labels using quick-response (QR) codes, radio frequency identification (RFID) tags or near field communication (NFC) chips, or a combination of these, make the connection between a piece of clothing and the trove of information stored in online databases.

Drawing on its expertise in making jacquard braiding, Maison Neyret developed a woven QR code label nearly a decade ago. Based in Saint-Etienne since 1823, the family-owned company is also a maker of composition and care labels. The high degree of variability that these tags have come to require, with translations in dozens of languages, led the company to digitise its production process early on. It was a first step in the engineering of a jacquard loom capable of weaving several million unique QR codes in a single run. "This is the first smart label we developed, and it is the direct result of the company's two skills: jacquard weaving and software development," says Sylvain Rivoire, its marketing and innovation manager. It is no coincidence that jacquard looms are considered forerunners of today's computers. They are an early system based on 0s and 1s, rendered in the form of punched cards.

This unique jacquard QR code is now managed by Sansara, Neyret's digital division, and more than 4 million labels are in circulation today, says Mr Rivoire. They are made from certified recycled yarns and can be recycled without being removed



US outdoor brand Artilect has integrated a YKK TouchLink smart zipper in its Divide Fusion Stretch Hoodie.

CREDIT: ARTILECT



French passementerie, or trimmings, maker Maison Neyret has devised a jacquard loom capable of weaving several million unique QR codes in a single run.
CREDIT: MAISON NEYRET

from the product. This would not be the case with an RFID or NFC tag: these are considered e-waste and must be disposed of accordingly. A QR code can be copied, but Sylvain Rivoire says that a woven label is a bit more difficult to clone and Neyret includes encrypted elements to prevent fraud. They do not add extra cost to garment manufacturing, as they are sewn in with a composition label. This could be an issue for this type of smart tag as consumers may be tempted to cut it off. "We may need to change our habits with regards to labels," suggests Mr Rivoire. He notes that there is a business case for this, "a product without its original label will have less value on the resale market."

To cover all of the apparel industry's traceability needs, from supply chain management (SCM) to sustainability monitoring and to consumer engagement, Neyret now offers an entire range of digital and physical tracing solutions that connect to an online platform, Scalabel, where data is stored and can be made accessible, or not, to a product's various stakeholders.

Chip in a yarn

Like QR codes, which became mainstream during covid-19, we are generally familiar with the large square RFID tags affixed to goods. These SCM and anti-theft devices are now essential for retailers, but they are relatively cumbersome and usually quickly cut off by a wearer. Consumers are less likely to remove an RFID tag in the form of a length of thread as they will simply not know where it is. Adetexs, a UK company, and Primo1D, in France, have developed such microchip-embedded yarns. RFID makes it possible to scan and identify the contents of a shipping box or a container of goods in one go, which is why it is widely used. It does, however, usually require a special reader, not usually found in smartphones, limiting its benefits as a brand marketing tool.

After extensive research, French sports retailer Decathlon chose Primo1D's RFID E-Thread as its preferred traceability technology. The fact that users will not feel it was a big draw, says Jérôme Lemay, Decathlon's head of industrial RFID. He adds that QR codes were ruled out because they can only be read at close range and can fade with washing, and that NFC chips might resist laundering but also have short scanning ranges. The retailer was looking for a technology that lasts the life of a product, up to its recycling.

Founded in 2013, Primo1D developed its RFID-embedded yarn at the CEA-Leti research centre in Grenoble. Flexible and durable, it is imperceptible in an item of clothing and allows real-time and high-speed product identification for traceability, authentication, Industry 4.0, and future automated sorting. The company is currently scaling up production. It has one line running at its headquarters, also in Grenoble, where a 4-metre-long machine produces the smart tag in two formats: embedded in a yarn or a ribbon. Currently available in white, a darker shade is in the pipeline, Valériane Henry, business



Primo1D embeds an RFID chip into a yarn or a ribbon and has devised a machine to integrate the smart tag into seams.
CREDIT: PRIMO1D

development manager, tells *WSA*. The slim tags can be inset in an interlock seam or a hem using a machine the company has developed and patented. The microchip itself is connected to two antennas, whose length depends on need. "A 13 to 14 cm long antenna can be read from a distance of 12 metres," Ms Henry says. A robust technology, it can withstand 100 home launderings, as well as dyeing and finishing processes. "Our E-Thread is integrated during manufacturing and will last until a product ends up in a sorting facility," she says, adding that it can also be useful for new business models such as rental, resale and repair, as well as, of course, a future digital product passport (DPP).

The RFID Thread technology, invented by Dr Anura Rathnayake, founder of Adetexs (formerly EON.ID), is similar in that a tiny microchip is embedded in a yarn and its 10cm recycled metal antenna is encapsulated in resin, allowing it to withstand 200°C washings. It is now also available paired with an NFC ring, says Alison Jose, founder and CEO of Global Circular Network (formerly Circlolink), which is looking to scale up its adoption. The Australian national lives in India where she is specifically seeking to convince and support small businesses and even artisans to adopt the smart tag. CIRPASS, an EU consortium working on the backend of the future European DPP, is evaluating the technology, which has recently been chosen by Nordic Circular Hotspot, an organisation seeking to accelerate the transition to a circular economy in the Nordic countries. Ms Jose expects this partnership to kick off bulk manufacturing, and thus reduce the cost of the smart thread.

Promoting reuse before recycling

"We are putting economy in the circular economy," she says. "In addition to bulk scanning, the RFID Thread can streamline resale, rental and repair services. It can also make design for longevity an asset as it will record a product's impact throughout its use, by various owners, and thus contribute to a company's sustainability goals. We need to offer brands a return on investment that makes it worthwhile for them to adopt the technology. The point is to extend a product's life, not recycle it."

At a product's end of life, sorters will need to remove the electronic tag, but she says that this is the starting point of its own resale and reuse. "This creates a new revenue stream for sorting facilities that have a hard time making money these days," she points out. As a special reader is needed to access data, it leaves out consumer engagement, unless the RFID thread is combined with an NFC chip. But then, its placement needs to be made visible.

Smart accessories

YKK's TouchLink turns an essential element of a zipper, its puller, into a smart accessory by placing an NFC tag inside. The chip's placement itself is an asset. Unlike a sewn label, its owner will not remove it and it is easy to access. But it was



Global Circular Network is working to scale up the bulk manufacturing of Adetexs' RFID Thread technology. It recently added an NFC chip to the smart tag.

CREDIT: GLOBAL CIRCULAR NETWORK

no easy feat to develop. "The microchip cannot be embedded in metal and requires a TPU material," says TouchLink product manager, Brian La Plante. It is also "heat sensitive to a degree, which implies controlling its environment during manufacturing." It has been tested to withstand 50 industrial laundry cycles. While the chip itself is tiny, its antenna needs some space. "Its design directly affects its ability to broadcast," he says. The Japanese company is constantly working to extend its range, which is about 5cm today.

TouchLink was first trialled by Swedish outdoor brand Houdini in 2021, and is currently used by sports brands Artilect in the US and Portance in Germany. The smart puller is available on size 5 zippers (coil and Vislon) and YKK plans to introduce a model suitable for luggage.

The short transmission range of an NFC chip means that a TouchLink zipper does not allow bulk

TRANSMISSION TECHNOLOGIES

Quick Response (QR) codes are like barcodes but use patterns of squares instead of lines to encode data. A QR code can contain words and phrases such as internet addresses. It can be static, that is unmodifiable once a code is generated, or dynamic and editable.

RFID and NFC tags use radio waves, in various frequencies, to transmit information. RFID can only be read by a special device, but it does not require line-of-sight and its scanning range can be a few centimetres to over 20 metres. Low, high and ultra-high frequencies can be used to communicate data, but the lower the frequency, the shorter the reading range. An NFC chip allows two-way communication, which offers more potential features. It can only be read in proximity (a few centimetres), but any NFC-enabled device, such as a cell phone, can access its data.

> **“Brands can use these technologies to maximise consumer engagement and create new revenue streams.”**
>
> BRIAN LA PLANTE, YKK

scanning, but it does enable two-way communication, says Mr La Plante. “A lot of time, energy and money goes into getting a product into the hands of a consumer, and that is when a brand loses its connection both to its product and its buyer.” Additional features, new ways of engaging with customers, services that could even generate supplementary revenue, can be added to an NFC-tagged item after it has been sold. YKK has partnered with several software companies to offer different after-sales services, from basic traceability for rental or resale, to anti-theft, customer engagement and even AI-powered functions. Mr La Plante doubts that NFC chips, or QR codes, will be useful at the end of a product’s life. “Given the mountains of clothing collectors receive, sorters and processors need a technology that is fast and at scale. Will they have time to scan a QR code or a chip? Probably not,” he says.

The issue of interoperability

The data that these electronic tags carry, or rather link to, can be made accessible or not, and can be modified, as they basically just store an internet address or URL. In theory, this makes them versatile, readable or editable by a company’s SCM software, or online and in store for a retailer. “It is just a matter of adding a brick to the software, it is not difficult,” says Mr Rivoire, at Neyret.

“Interoperability is inevitable,” says Stéphane Popescu, founder of COSE 361, a French sustainability consultancy. “Today, these technologies are not yet mature. But look at email. Whatever system you use, gmail, Outlook, or whatever, we can send each other emails without ‘interruption’ because service providers have made it interoperable.” He does not see why traceability shouldn’t be the same, and believes interoperability will be “accelerated by regulations such as the EU’s Ecodesign for Sustainable Products Regulation (ESPR) and digital product passports.” A solution provider may want to keep its customers in a closed platform, but he says this is “untenable in the long term” and would contribute to “traceability fatigue”.

Digital or physical?

For Mr Popescu, there is no reason to pit digital and physical traceability solutions against each other. “They are complementary and, in the future, will be enmeshed. Digital traceability is a prerequisite as it enables data mapping and sharing, but a physical tag links that information to a specific product.” This, he says, ensures a higher level of security with regard to data veracity.



YKK’s TouchLink NFC-equipped zipper puller offers brands a new trigger point with consumers. Possible user functions include keeping friends in the loop when out, and activating Spotify or Strava. Brands can use it to send notifications for special events, flash sales, and so on.
CREDIT: YKK

To make the right choice, COSE 361 recommends putting together a multidisciplinary team, as it requires skills in many areas, from IT to production and purchasing, marketing and communications and to legal and finance. One of the pitfalls that Mr Popescu sees is that brands limit their investment in traceability to basic compliance requirements: “Companies should use ESPR and DPP as a means of adding value, whether economic or intangible, to strengthen their position in the market.” Brian La Plane, at YKK, agrees: “A brand will always see it as a cost. I am waiting for brands to understand that they can use these technologies to maximise consumer engagement and create new revenue streams. Instead of being just imposed by law, it should be a value-add.”

The future roll-out of impact ratings or eco-scores may encourage the adoption of these technologies. “In France, we have experience with their application on food. Eco-scores are not perfect, but they do help consumers make better choices,” says Mr Rivoire. Alison Jose, at Global Circular Network, remarks that “it is going to be difficult for smaller companies to meet their compliance obligations. Our impact rating system will make it more compelling to collect data.” A widespread deployment of these smart tags ultimately depends on two factors. For one, that their implementation be less costly or mandatory. Second, they allow new services that can strengthen a brand’s image or generate new revenue. Only then will it be truly worthwhile to keep trace of a product digitally and physically.

Hidden protection for easy riding



By anyone's standard, it takes a lot of courage to be willingly dragged along behind a car with only a pair of jeans between you and the tarmac. But for Pierre-Henry Servajean, owner of Armalith fabric, this was the best way to demonstrate the abrasion resistance and protection offered by his super-strength denim. Influencers, customers and even journalists offered to potentially sacrifice a layer of skin in the name of research. Of course, all tests were done under strict safety conditions, which is particularly important for the stunt riders when comparing Armalith to regular jeans. But the tests also revealed results that the company could not replicate in the lab, according to Mr Servajean. "We discovered that when you fall at 28 kilometres per hour, it feels dangerous," he tells us. "Some competitors can offer abrasion resistance but, after only a few metres, the skin is burnt. This parameter is not measured by the certification, so it is an extra protection we can prove."

A 'Sunday' biker, Mr Servajean spied a gap in the market for an alternative to biker leathers that enabled cooler and more comfortable outfits and yet offered the same protection. He believed there must be an answer in the textiles world. In the early 2010s he began the search for a material that would be strong enough for safety but could still be woven into a wearable fabric, as well as a mill partner "crazy" enough to take on the challenge. "This crazy guy had a great idea and something that was unique, and something that is still unique, and he met our crazy guys in Spain," Jose Royo, director of Spanish mill Tejidos Royo, tells *WSA*. "He gave us a very important challenge and we were we were able to succeed after three years."

RISE TO THE CHALLENGE.

Taking a material from the aerospace industry, a "crazy" idea became a viable product in the hands of the textiles masterminds at Tejidos Royo. The result is a fabric so strong it could replace biker leathers – and it has now been tailored to the cycling and e-scooter market.





Kevlar and ceramics were considered for the core fibre, but ultimately it was an ultra-high molecular weight polyethylene (UHMWPE) that gave the best results. Compared with Kevlar, UHMWPE is five times more resistant to abrasion, 40% lighter, has 2.5 times greater tensile strength and retains its properties 10 times longer when exposed to UV light, the company states. For these reasons, it is usually used in military and aerospace applications, such as space module re-entry ropes, armour and mooring cables.

The fibre needs specific handling in low temperatures, which called on Royo's technical know-how to modify its machinery, changing the spinning and weaving processes. The UHMWPE core is covered with a cotton fibre and combined with Lycra dualFX technology, which uses elastane and a polyester bi-component fibre for stretch and comfort. The resulting fabric looks and feels like denim but offers extreme resistance to cuts, traction, tears and abrasion. The high UV resistance preserves its mechanical properties, and although the core is "indestructible", it can be treated and finished in the same way as conventional denim.

Performance focus

The material is made by Royo's specialist fabric division, Royotec, which makes performance and protective fabrics for sportswear, workwear, firefighters, heavy industry and the medical sector. Based over four factories in Valenica, the 100-year-old family-run company can spin, dye, weave and finish, giving it control over the finished fabrics.

In 2018, Royo pioneered a foam machine that dyes using almost no water, following a decade of research involving Texas Tech University, machinery maker Gaston and consultancy Indigo Mill Designs. The yarn is fed in at the top of the machine, turning yellow and then blue as it oxidises. The machine is three metres high but only 4.5 metres long, taking up less space than a standard dye bath. It wastes less yarn, too; a standard machine might need 600-800 metres running through once it starts; this machine would need only around 200 metres. As well as using no water, the process uses 65% less energy and 90% fewer chemicals than the standard process. No water also means no wastewater to dispose of – "for me, this is almost more important than saving

Left: Testers are dragged along a set length of tarmac, reporting no holes in the jeans afterwards, just a feeling of "warmth".

Right: Jeans made with Armalith are so strong, they are able to lift a Hummer.

ALL CREDITS: ARMALITH



The idea for the fabric came from Pierre-Henry Servajean's love of biking. He has launched a brand, Bolid'ster, that showcases the full range.

water," Mr Royo says. A year after the launch of DryIndigo, which has been used by companies including Wrangler-owner Kontoor, Royo launched a DryBlack process and, last year, DryColor. "This is the only technique that dyes colours with zero water; we can do any colour with no limitations," Mr Royo tells us. "By 2030, we aim to be a zero-water textile company."

Royo has recently invested €5 million in a revamped spinning plant, which opened in May and that will enable it to broaden its offering. "If we invest in a spinning planet in Europe, it is for one reason: because we believe in the future of textiles," says Mr Royo. "We have invested this money not because we want to do more volume, on the contrary. What we want to do are the special projects. We want to be the 'know-how' company in Europe. Our target is innovation, not volume."

Cost cutting

Armalith fabric is dyed using IndigoZero and is available in seven weights or with different performance levels, with target customers including motorcyclists, moped riders and even stuntmen. A new lighter weight has been added for sports applications such as skating, cycling and for use of e-scooters. The lowest level, Mobility, protects against impact abrasion over a distance of four metres or following a fall at 27 km/h; while at the top of the range, Moto GP protects over 56 metres, with bikers reaching speeds of 120km/hour. Armalith's mechanical qualities are equivalent or superior to the requirements for Moto GP race clothing, said the company, with brands including Belstaff, Harley Davidson and Dainese selecting it to protect their customers.

The added bonus of the abrasion resistance is its durability. Jeans and jackets made with Armalith from French brand Bolid'ster, for example, have a 10-year guarantee. The longer they last, the fewer that have to be made, points out Mr Royo: "We need to leave the land for food and not for cotton." Next up will be a version made with recycled cotton – although this could be five years away, he admits, such is the performance demanded of the fabric.

"There are a lot of price-driven fabrics and garments in the market, but we are investing money into smart textiles, recycled textiles, regenerative cotton textiles and to make durable fabrics. There will always be somebody cheaper than you – first it was China, then Bangladesh and tomorrow it will be somewhere else. With the cost of energy and manufacturing in Europe, it is very difficult to fight on price, so we're trying to be different, and when you have something unique, people are willing to pay a little bit more. That's why we're so focused on research and development."

Royo's investments in its processes and practices have benefitted not only the environment but also the bottom line. The price of Armalith has been cut almost in half, because of the improvements in the manufacturing processes. And what about the wearers, skating around parks, cycling on dirt tracks or speeding along roads and circuits? "Every season we get feedback from riders who have fallen off their bikes," says Mr Servajean. It is likely they would say losing a limb, or even a life, would be a high price to pay; not the cost of the fabric.



The durability of the fabric is such that it can also be used in footwear, like these trainers from Helston.


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FOOTWEAR TECHNOLOGY

Advances in adhesive technology are opening up new possibilities for recycling athletic shoes.

A solution for a sticky problem

The push towards circularity involves almost all brands, all products and all materials, but each faces its own specific challenges. One that applies to footwear more than to apparel, for example, is the extensive use of adhesive in shoe construction. For recyclers, this complicates the necessary separation of materials at end of life.

As part of a recent Black Friday campaign, sustainability-focused shoe brand Vivobarefoot said that 90% of the footwear produced each year worldwide will end up in landfill, much of it within 12 months of being purchased. This means consumers are discarding billions of pairs each year, with the complex material mix in many of the products contributing to lengthy biodegradability times.

Sports shoes in particular often have a complex mix of fibres and fabrics in their composition, taking into account uppers, midsole, outer soles and other components. As well as making these products difficult to recycle, the diverse materials can be difficult to bond in the first place. Adhesives manufacturers such as Henkel insist that flexible adhesives are often the best option for shoe manufacturing because of their high workability and high productivity. But Henkel admits that this comes at a price. "The environmental concerns about the adhesives used by sports and running shoe manufacturers have also become more complex and acute," the company says. Its portfolio for shoes includes polyurethane hot melt and quick-drying cyanoacrylate adhesives.

First tasks

The ability of these adhesives to bond layers of rubber, polyester, thermoplastic polyurethane, ethylene-vinyl acetate and other materials to one another is what makes footwear hard work for recycling specialists, for whom separating out the different fibres in any product is always one of the first tasks.

Attempts at circumventing this hurdle have led creative companies like Clarks, with its Origin collection in 2021, and Nike, with the ISPA Link Axis launch in 2023, to create glue-free shoes, with recyclability and circularity in mind.

Glue-free shoes

Origin shoes were made for easy disassembly at end of life. Five pieces made up each shoe, with recycled content in the sole and the laces. Other pro-recycling components were mono-material nylon thread for the stitching. Clarks acknowledged from the outset that the inclusion of glue in shoe construction is what makes footwear difficult to recycle and said this was why it made the Origin collection glue-free. Clarks has confirmed to *WSA* that this collection is no longer commercially available.

Nike's more recent ISPA Link Axis collection is still available at the time of writing. In the sports brand's announcements about the Link Axis, it emphasised the shoe's recyclability. It said: "A good shoe is flexible and durable. Designers use glue and other bonding elements to achieve these aims, but that makes a shoe nearly impossible to disassemble and recycle. Every part of the Link Axis can be recycled. The design uses interlocking components, as few materials as possible and zero-glue."

Stuck in reverse

These examples are the exception rather than the rule. Almost all shoes do still have glue, but in spite of this there are other avenues along which the footwear industry can move towards circularity. If glue is going to continue to be an important part of the construction of most footwear, it is a good thing that innovative people are now working hard to improve adhesive technology to make it more recycling-friendly. One clever idea that has come to light in 2024 is that of so-called reversible glues, adhesives that bond effectively for as long as a product is in use, and then stop working when you want them to. In this way, the separation of the fibres and fabrics in a shoe will become much easier.

Earlier this year, Dr Barny Greenland, an academic at the University of Sussex with a specialist interest in developing responsive polymeric and supramolecular materials, spoke to the BBC about adhesives that debond on demand. He describes the ideal outcome as a glue that will work well for as long as we want it to, but stop working "at the flick of a switch".



ASICS has made the Nimbus Mirai shoes for runners to use extensively and then send back for deconstruction and recycling. A special type of adhesive that ASICS has developed in-house bonds together the materials only until the shoes reach end of life.

CREDIT: ASICS

He explains that the concept is all around us, as anyone who has had to remove old wallpaper from the wall of a room in their house will readily recognise. Paste that has kept the paper attached to the wall for decades will unstick quite easily if you apply the right amount of heat and the right amount of moisture, Dr Greenland explains. Moving from interior decoration back to shoes, though, generating the right amounts of heat and moisture to glue can be problematic, not least because shoes bonded with adhesives that respond in this way could function poorly in a hot and humid climate. Athletic footwear is a global market, after all.

Control mechanism

This has led Dr Greenland and his team to search for "more controlled" ways to achieve the reversibility of adhesives. An early idea that the University of Sussex team investigated was a glue that "responds to a specific chemical". A shoe with a leather upper and a rubber sole is one of the applications the academic mentions in connection with this. At end of life, you can immerse the shoe in a liquid containing the specific chemical. "The glue will break down and you will be able to recycle the leather in one stream and the sole of the shoe in another," he says.

There are practical challenges with this, though. How big would the tank need to be to treat a whole batch of discarded shoes? What effect might the chemicals have on the materials you are trying to reclaim for reuse?

Inspired, curiously, by kitchen appliances, the team has come up with an idea that offers a much more controlled way of triggering an end to the glue's stickiness while avoiding any degradation of potentially important recycled raw materials. An induction hob will put heat directly into the base of a metal saucepan, while the hob itself stays cool. "We thought we might be able to use this idea as a way of transferring energy into glue," Dr Greenland says. "This means heating up the glue, but not the materials surrounding it. The way that you can do this is by adding very small particles of iron or iron oxide into your glue and then sticking the surfaces together. You will later be able to unstick objects, even when you cannot get to the surface with the glue. A magnetic field will pass through the object and interact only with the glue. You can heat up the glue and de-bond your object." He says this principle is not dependent on special new glues; any thermo-responsive adhesive will work in the same way.

Ready to be remade

By coincidence, in the same week in which the BBC broadcast these comments from Barny Greenland, athletic footwear brand ASICS, on the other side of the world, announced the Nimbus Mirai. The Japanese company described its new product as the most advanced shoe it has ever made. It wants runners to buy the shoes, use them extensively and then return them to the company at end of life so that the materials in their construction can be made into new products. Therefore, even at end of life, the product will have a future; the name Mirai means 'future' in Japanese.



Shoes are notoriously hard to recycle. Glue gets a lot of the blame. Clarks made an early attempt to create something more circular with its glue-free Origin shoe in 2021.

CREDIT: CLARKS

Its construction comprises a uniform polyester material and the upper has no overlays. Unlike in the Clarks and Nike examples, glue comes into this story, too. ASICS has used "a special type of adhesive", created in-house, to provide durable bonds while the shoe is in use. But this adhesive is reversible, so it also makes the upper easily detachable from the sole during recycling processes. The whole of the upper will go through recycling, ASICS has confirmed, and be retrieved as a new polyester material, "ready to be remade to run again".

Designing for circularity means knowing, before you make anything, how it can be unmade and remade at end of life. Reversible glues are on course to be an important part of designing shoes and other products for the circular economy, Dr Greenland insists, because they will make it much easier for brands to build collections that are easy to take apart again when the time is right.

Nike has explained that glue makes shoes "nearly impossible recycle". This is why it made the ISPA Link Axis shoe without glue.

CREDIT: NIKE



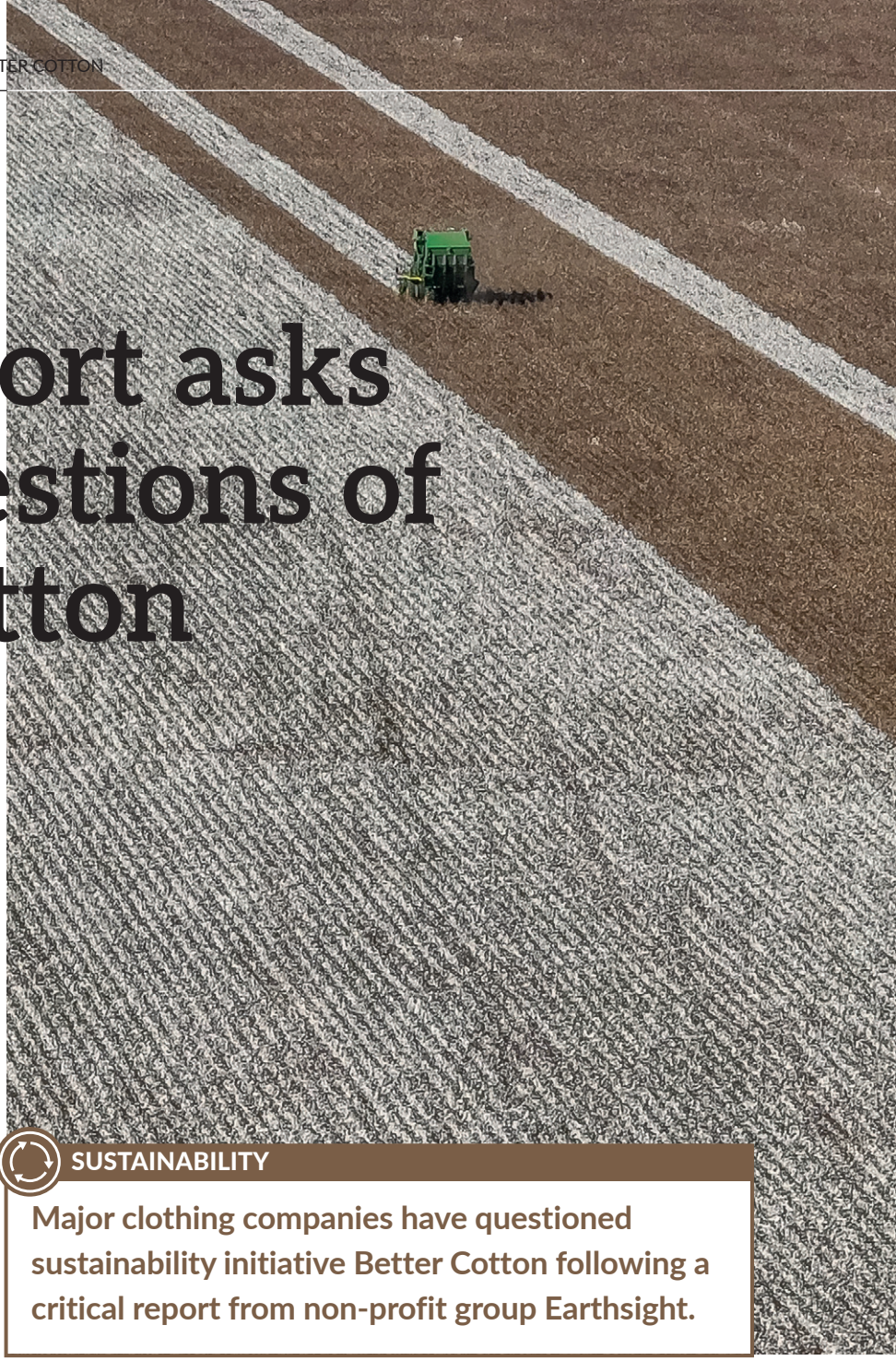


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Brazil report asks tough questions of Better Cotton

SUSTAINABILITY

Major clothing companies have questioned sustainability initiative Better Cotton following a critical report from non-profit group Earthsight.

Campaign group Earthsight has published a report on Brazil's Cerrado region in which it accuses large cotton producers of illegal deforestation, land-grabbing and violence against communities there.

London-based Earthsight says it worked on the report for a year analysing satellite images, court rulings, shipment records and other documents, and talking to people on the ground. From this, it has alleged that cotton grown in the western region of the Brazilian state of Bahia by two of the country's largest producers, SLC Agrícola and Grupo Horita, "is linked to a number of illegalities". Earthsight also alleges that Horita and SLC Agrícola are "emblematic of a broader reality of export-oriented agribusinesses inflicting harm on the Cerrado, its traditional communities and the climate". The Cerrado is a vast tropical savannah biome that spreads across ten states in Brazil, as well as into parts of Paraguay and Bolivia. It covers 2 million square-kilometres in total, with around 75% of the land in private ownership.

In its report the campaign group says that cotton from the farms in question has come onto the global market with certification under the Responsible Brazilian Cotton (ABR) programme. This programme is run by Brazilian cotton producers' association Abrapa and operates under a benchmarking agreement with global cotton sustainability initiative Better Cotton. "In effect, this means Better Cotton and Abrapa's ABR are granted as a single certification to Brazilian cotton farmers," Earthsight says.

SLC Agrícola and Grupo Horita have threatened to take legal action against Earthsight if they consider its report harmful to their reputations. Abrapa has told Earthsight that if the two Brazilian companies decide to press ahead with legal action, it will support the cotton producers.

Response from Abrapa

At the end of April, two weeks after the Earthsight report appeared, Abrapa said a sustainability working group that it runs had already met to discuss ABR and its links to Better Cotton.

The working group discussed Abrapa's relationship with Better Cotton, resulting in an acceptance that for the single certification concept to work, the criteria for both programmes may need to line up better. Abrapa said the industry in Brazil would be in a position to use the latest version of Better Cotton's principles and criteria, version 3.0, in its certification programme for the 2024-2025 cotton-growing season. This is in keeping with the timeline Better Cotton has set out for growers around the world.

This relatively proactive and constructive response from Abrapa shares space on its corporate website with much more negative sentiments. Abrapa has shared an article that weekly news magazine *Oeste* published about the practices Earthsight claims to have unearthed in Brazil. The article talks of "a so-called investigation", and says the London-based organisation has no reliable source for what it alleges.



Cotton harvesting near São Desidério. Brazil is projecting a crop for 2023-2024 of 14.6 million bales, which would make it the third-largest producer of cotton in the world, behind China and India.

ALL CREDITS: THOMAS BAUER/ EARTHSIGHT

The magazine goes on to quote the owner of one of the companies, Walter Horita, who says he was shocked to see the report because he thought all the questions Earthsight raised had already been resolved. Grupo Horita sent documents, photos and videos, but according to the company owner, Earthsight did not respond and ignored the information. "We have nothing to hide," Mr Horita tells *Oeste*. "We have strict laws in Brazil for agricultural products. If we did anything wrong, it would be impossible for us to prevent the supervisory bodies from finding out." The magazine says SLC Agrícola has also insisted the allegations are without foundation.

Scrutiny welcome

In the wake of the Earthsight report, Better Cotton formulated a detailed response of its own. It commissioned an independent audit to investigate the allegations.

Chief executive, Alan McClay, said on announcing this: "We welcome the scrutiny of organisations such as Earthsight as they help to shine a spotlight on areas where oversight needs to improve. Better Cotton's mission is to promote more sustainable agricultural practices globally, helping cotton communities survive and thrive, while protecting and restoring the environment."

Advisory firm Peterson conducted the audit and concluded that three of the farms mentioned in the Earthsight report were licensed to sell Better Cotton, but that these three particular farms were not in breach of Better Cotton's standards. The Peterson audit found no relation between the accusations that Earthsight has made relating to community impact and these three farms. In relation to deforestation, the Earthsight report refers to fines at the farms in Bahia, but the auditors' conclusion was that these fines related to breaches that occurred years before the farms



Cotton bales in a field in the western part of the Brazilian state of Bahia.

started working with Better Cotton. Satellite imagery has confirmed that no new land has been converted at these farms since 2008 and there are no areas currently under embargo, the audit states. There was, therefore, no breach of standards, Mr McClay's organisation insisted.

However, the auditor's report found that the ABR standard "should evolve to become more focused on issues such as community needs and the cultural values of land, and to ensure that land conversion does not occur in areas of high conservation value". In addition, the report said that the ABR criteria should be strengthened to ensure that producers are not engaged in acts of corruption.

When *WSA* asked Earthsight for its reaction to Better Cotton's response, it questioned the audit report's assertions. Deputy director at the campaign group, Rubens Carvalho, says Better Cotton's claims regarding farms' certification status fail to line up with information that Abrapa has made public about cotton production facilities in Brazil in an online database. A simple search of the database shows the name of the farm, the nearest town, the group that owns it and the status of its ABR and Better Cotton certifications. In this case, a comparison of what Abrapa says is certified, with what the companies themselves say is certified and what Better Cotton says is certified throws up "an inexplicable discrepancy," Mr Carvalho says.

He goes further, calling the audit that Peterson has carried out "so flawed as to be almost worthless". According to Earthsight, the audit that Better Cotton commissioned examined only "a tiny proportion" of farms named in the original report's allegations.

Another shortcoming in the audit that the campaign group points to is that it makes no mention of ongoing disputes over land between cotton growers and traditional communities. Mr Carvalho explains that these disputes often involve land that is remote from the existing farms, but which the same cotton-growing companies are trying to take control of. Earthsight also says it has been unable to verify from its contacts on the ground claims that the auditors engaged with local people.

Finally, it notes that Better Cotton has accepted that SLC and Horita have faced fines for environmental infractions in the past, before becoming certified. Earthsight's view is that allowing companies that have broken the law to become certified afterwards shows the certification programme's "inadequate approach".

Where the cotton went

Amid the claims and counter-claims that Earthsight, Better Cotton, Abrapa and the cotton growers have exchanged, the most important reaction to this controversy has come from the apparel industry. Two of the biggest clothing groups in the world have become involved. There was nothing accidental about this. Earthsight has admitted that it intended from the outset to weave these major players into the narrative and

A new report from campaign group Earthsight has linked cotton produced in Brazil to deforestation, land-grabbing and violence against traditional communities.



it makes no apology for doing so.

From its analysis, Earthsight concluded that many of the bales of cotton from the farms in question were first shipped to mills in Asia. It has named PT Kahatex in Indonesia and the Jamuna Group in Bangladesh among the recipients. The first of these is a supplier to H&M, the second is a supplier to Inditex. Both apparel groups have issued statements in response to the original report. H&M and Inditex do not buy cotton directly, but mills and garment manufacturers that supply fabric and clothing to the two fashion groups have sourced cotton from the farms in the frame.

PT Kahatex, the largest buyer of the cotton at the centre of the allegations, has H&M as its second-biggest customer. Earthsight says the Swedish group has sourced socks, shorts and trousers containing this cotton from the Indonesian supplier. In parallel, it says stores run in Europe by Inditex's main brand, Zara, have sold jeans and other denim clothes worth €235 million manufactured by Jamuna. Earthsight says this equates to approximately 21,500 pairs of jeans a day across the vast network of Zara stores.

When Earthsight published its report, H&M said it requires all of its suppliers to source sustainable cotton. Its requirements also include the stipulation that the standards and certifications under which the cotton is presented as sustainable must be "credible and robust". It added: "We rigorously monitor that our requirements are met."

H&M said the findings from Earthsight's report were "highly concerning" and that it was taking the allegations very seriously. It said it had entered into close dialogue with Better Cotton about the report's claims and about the third-party investigation Better Cotton commissioned. It concluded: "The report clearly highlights the need for all actors to continue the work to further improve standards and traceability systems, which we fully support."

The details of Inditex's reaction have been less public, but Better Cotton has confirmed to *WSA* that its chief executive, Alan McClay, received a formal letter from the Spanish group asking the cotton sustainability organisation to put in place a plan for offering the apparel industry maximum visibility into its certification practices, and for taking forward "in a decisive manner" its work on traceability.

> **"We welcome the scrutiny of organisations such as Earthsight as they help to shine a spotlight on areas where oversight needs to improve."**
>
> ALAN MCCLAY, BETTER COTTON

Pressure points

In its conclusions, Earthsight makes no excuse for making these major players in the global apparel industry part of its efforts to "put pressure on" Better Cotton. It says Better Cotton must make sure crops produced on deforested land do not carry positive environmental certification and that audits and the award of certification are the work of independent actors.

It has also called on legislators in the European Union, the US, UK and elsewhere to "ramp up their ambition" and put in place laws that will make it more difficult for harmful practices to continue and for organisations to benefit from those practices. It points out that, for example, new rules that will come into force in the EU at the end of this year under the EU Deforestation Regulation (EUDR) will have no effect on the examples of bad practice it says it has uncovered in this report. The new rules seek to guarantee that products from a list of commodities coming into the EU have no links to deforestation; they are stringent. There are seven commodities on the list. Cotton is not one of them.



Part of the vast and environmentally priceless Cerrado biome, this waterfall is in an area owned by SLC Agrícola, near Barreiras in the state of Bahia.

> Shaoxing is the biggest fabric-manufacturing city in the world and if we can have green energy here, we can save the planet.
>
> ANDY DONG

Positive energy

Founder of China-based performance fabric developer Dry-Tex, Andy Dong, shares insight into some of his newest ideas, from using salt to generate clean energy for steam dyeing, to convincing major brands of polypropylene's positive attributes.

DIALOGUE

Andy Dong, founder of Dry-Tex



CREDIT: DRY-TEX

You have earned a reputation for being able to identify early what the market will demand in the coming seasons. What new developments are taking up your thinking time at the moment?

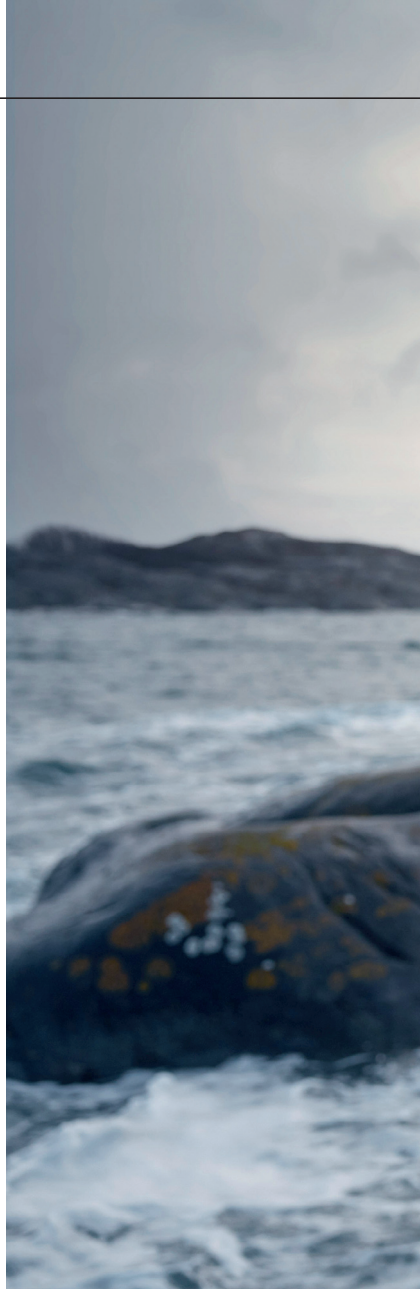
On a recent visit to Sweden to visit customers, including jacket brand Didriksons and golf and ski apparel brand J Lindeberg, it seemed to me that everybody was talking about how to reduce carbon emissions. We discussed recycled polyethylene terephthalate (rPET) from waste plastic bottles and textile-to-textile recycling, plus recycled nylon, bio-based nylon and solution-dyeing. After returning to China, we got together as a company and decided to transition to 100% green energy, beginning this year. Our costs will be higher, but we need to take this action. We already have the ability to make this change because we have the right connection to the national grid; we can buy green energy. It is a big step for us, but a very good one. We were also inspired to do this following a conversation we had with the Decathlon team last year. The green energy will come from renewable resources, from wind and solar panels in north-west China. We calculate that this can help us save more than 20,000 tonnes of carbon emissions per year, which will be 1.2 kilos of emissions for every metre of fabric we produce.

Will this take care of all your energy needs?

In the textiles business, we are largely dependent on two energy sources: electrical power and hot steam for dyeing. Both can produce carbon dioxide. If we use green energy, we can figure out the electricity part. But all over the world, hot steam comes from coal. This has generally been the biggest headache. However, the good thing is, we think we may have found a solution.

What is the new idea?

The new technology is based on ordinary, edible salt. At the moment, for the most part, a government-owned company supplies hot steam to China's industrial parks, including the one where our factory is based in Shaoxing, Zhejiang province. One of our neighbours in Shaoxing is a very high-tech company, which has been working on a way of converting green electricity into heat energy and storing it in high-temperature molten salt. You can imagine how much energy is required to make this salt melt into liquid form, it needs lots of heat. They've built a tank to store the salt and use electric power to heat the salt and melt it into liquid during the night. This requires a temperature of 543°C. And in the daytime, this liquid turns into a solid again and lots of heat comes out. This heat can make hot steam for use in the dye mills. This is an investment of a lot of money for our neighbours. They are waiting for the result of some trials, and for feedback from the market. I don't know when we will be able to use it in our production for dyeing. It may take five or seven years, but at least we may have found a solution and my customers are super excited about this. This is important because we need support. Their support will help us talk to the government and to international holding companies about enlarging our facilities and making textile production more green. With this technology and our access to green energy, in the future we will be able to carry out the whole process, from yarn production to weaving and dyeing, zero-carbon.





Customers, including Swedish jacket brand Didriksons, are pushing Dry-Tex and other suppliers to do everything they can to reduce carbon emissions.
CREDIT: DIDRIKSONS

What have the trials of the salt technology shown so far?

They started a small trial last October and we will have to wait for the results to see how successful this has been. The cost of the investment is high and we need to have confidence that the technology will work and, as I mentioned, we will need brands to work with us. We have been involved in the trial. It is happening in our industrial park and we have connected the technology to our steam plant as part of the trial and we are quite proud of that. If the plan works out the way we hope, it could produce 16 million tonnes of hot steam for mills to use for dyeing. This will save 3.1 million tonnes of coal per year and that, in turn, will save 5.8 million tonnes of carbon emissions per year. I think this is quite interesting. Shaoxing is the biggest fabric-manufacturing city in the world. I think it makes 40% of the world's textiles and if we can have green energy here, we can save the planet.

Brands talk constantly of their desire to make advances in sustainability, but how confident are you of securing their support for this initiative?

Our business is 90% for European and US customers, many of them brands that are active in the sports market. Most of them care deeply about green issues. One of the reasons we are enthusiastic about this project is that our customers are pushing us towards this. Brands that have been sourcing from fabric mills in Vietnam, Bangladesh or Indonesia will know that it is hard to talk about green energy there. In China, it is part of national strategy to invest in new energy and we have large installations for solar power and wind power in the west of China, in the desert. It is expensive now but it will become cheaper and cheaper. I think this strategy can help China hold onto business and grow.

On the subject of Vietnam, in previous conversations with WSA, you have set out plans to expand production by setting up Dry-Tex facilities there. How have those plans evolved in recent months?

We have bought the land. We have been working hard on the many documents that the Vietnamese government needs and there are ongoing issues that we are still figuring out, for example, fire prevention. We want to quote the real capacity in our planning. We don't want to cheat at the outset because that could be quite dangerous. So we are still working on the

documents. We still think that Vietnam is a good place for textiles; many garment manufacturers are there and we will be able to offer them quick delivery. Another benefit is that it's near China. But at the same time, with the new energy projects we are working on in China, it may be two or three years more before we complete the plan for Vietnam.

When you last spoke to WSA, you shared that Dry-Tex's focus was then on warp-knit tricot fabrics for outdoor clothing. What progress have you made in this area and how have your customers responded?

It's a challenge because in many of the tricot fabrics, the proportion of elastane we needed was very high, sometimes as much as 25%. Some customers prefer not to have that because they want the whole garment to be recyclable, and mono-material garments are better for this. These tricot fabrics are doing well in some markets, though, for example in China.

Has Dry-Tex begun to do more business with Chinese brands? Is this as a result of how difficult international business became for a few years? What are the main differences that you see between the way Chinese apparel brands work compared to their counterparts in Europe and North America?

Our business in China is growing, and it is not only because of covid-19. Chinese brands are becoming bigger and they have good knowledge now and this makes it easier for us to work with them. Last year, sales of seam-sealed outdoor jackets in China were very strong. Outdoor jackets have become very fashionable. Since Anta became the controlling stakeholder of Amer Sports, in 2019, one of Amer's brands, Arc'teryx, has become very popular in China. The market for sports apparel in general is growing. Trail-running and hiking are very popular now and millions of people are travelling to the west of China, for example, to take part in outdoor activities in the mountains there. As a result, outdoor brands are expanding in this market. But it is a different market compared to Europe and North America, even in terms of product. As in Japan and South Korea, consumers in China like garments that have a very tight construction. Another difference is that the supply chain for the Chinese market is shorter and sometimes customers call to ask for changes from one day to the next. The process is faster compared to what happens with western brands.

You were among the first to emphasise the importance of lighter fabrics in advance of the huge demand for lightweight garments that we have seen in recent years. What is your focus right now, material-wise?

We are developing a new fabric with the face, membrane and backer made from polypropylene. It is good for it to be mono-component. Brands need to prepare garments for end of life. We have seen what is possible with garments that have a face-fabric all in polyester, a membrane in polyester, and the backer in polyester as well. This can be recycled. My customers have tested this at a college in Stockholm and have been successful in turning the polyester back into PET flakes to produce new fibres. I was also interested to see announcements like BASF's about Loopamid, its new version of polyamide 6, made from textile waste. Another thing about our new fabric is that polypropylene never gets wet and is always water-resistant and if brands use it, they will have no need to use durable water repellency (DWR) finishes with perfluorinated compounds. Also, polypropylene is lighter and warmer than polyester. So, for example, if you use polyester fabric that weighs 260 grammes per square-metre to make a fleece garment, you can achieve the same functionality with polypropylene that weighs only 180 grammes per square-metre. In many ways, polypropylene is the perfect material for outdoor and winter sports brands. The market is very interested in this. We have been a fabric supplier to Patagonia, for example, for a long time. It is one of the brands that are interested in this new material. Another aspect of this is that we think we have the ability to go from thicker to thinner yarns to make the fabric, possibly using yarns with a thickness of as little as 30 denier. This development is really exciting. We aim to move forward with it in the next few months.



Outdoor jackets have become very popular in China, with Arc'teryx one of the best loved brands.

CREDIT: ARC'TERYX

Footnote: Andy Dong spoke to WSA at Intertextile Shanghai Apparel Fabrics in spring 2024.

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